WHAT IS CLAIMED IS:

1. A method for purifying viruses from solution, the method comprising:
(a) combining the solution with an anionic polyelectrolyte;
(b) combining the solution with a cationic polyelectrolyte; and
(c) centrifuging the solution to obtain a supernatant and a pellet, wherein the pellet comprises the virus.

2. The method of claim 1, wherein the anionic polyelectrolyte is selected from the group consisting of glycosaminoglycans and polysaccharides.

3. The method of claim 2, wherein the glycosaminoglycans and polysaccharides are sulfated.

4. The method of claim 1, wherein the anionic polyelectrolyte is selected from the group consisting of chondroitin sulfates, heparin, heparan sulfate, keratan sulfate, carrageenans, fucoidan, poly-L-glutamic acid, poly-L-aspartic acid, poly(glycolic acid), poly(lactic acid), and poly(lactic-co-glycolic acid).

5. The method of claim 4, wherein the anionic polyelectrolyte is chondroitan sulfate C.

6. The method of claim 1, wherein the cationic polyelectrolyte is a cationic polymer that complexes with the anionic polyelectrolyte.

7. The method of claim 1, wherein the cationic polyelectrolyte is selected from the group consisting of (diethylamino)ethyl dextran, histones, protamine, poly-L-arginine, poly-L-histidine, and poly-L-lysine.

8. The method of claim 1, wherein the cationic polyelectrolyte is hexadimethrine bromide.

9. The method of claim 1, wherein the solution further comprises proteoglycans.

10. The method of claim 1, further comprising separating the pellet from the supernatant, and then resuspending the pellet in a resuspension buffer.

11. The method of claim 10, wherein the volume of the resuspension buffer is no greater than one-tenth the volume of the solution, thereby resulting in at least a ten-fold concentration of the virus.

12. The method of claim 10, wherein the volume of the resuspension buffer is no greater than one-hundredth the volume of the solution, thereby resulting in at least a one-hundred-fold concentration of the virus.

13. The method of claim 10, wherein the resuspension buffer comprises phosphate-buffered saline.

14. The method of claim 10, wherein the resuspension buffer comprises cell culture medium.

15. The method of claim 10, wherein the resuspension buffer comprises a pharmaceutically acceptable carrier.

16. The method of claim 1, wherein the virus is a retrovirus.

17. The method of claim 1, wherein the virus is an enveloped virus.

18. The method of claim 1, wherein the virus is selected from the group consisting of human immunodeficiency virus, lentiviruses, Moloney murine leukemia virus, herpes simplex virus, Epstein-Barr virus, human cytomegalovirus, influenza viruses, poxviruses, and alphaviruses.

19. The method of claim 1, wherein steps (a) and (b) are carried out in reverse order.

20. The method of claim 1, wherein steps (a) and (b) are carried out simultaneously.

21. A method for preparing a formulation for administering a nucleic acid molecule to a patient, the method comprising:

(a) obtaining a solution comprising a virus that comprises a nucleic acid molecule to be administered to a patient;

(b) combining the solution with an anionic polyelectrolyte;

(c) combining the solution with a cationic polyelectrolyte;

(d) centrifuging the solution to obtain a supernatant and a pellet, wherein the pellet comprises the virus;

(e) separating the supernatant from the pellet; and

(f) resuspending the pellet in a resuspension buffer suitable for injection into a patient to prepare a formulation for administering a nucleic acid to a patient.

22. The method of claim 21, further comprising:

(g) separating the virus from the polyelectrolytes.

23. The method of claim 21, wherein steps (a) and (b) are carried out in reverse order.

24. The method of claim 21, wherein steps (a) and (b) are carried out simultaneously.

25. An assay method for detecting the presence of a virus in a sample, the method comprising:

(a) obtaining a sample to be assayed for the presence of a virus;

(b) combining the sample with an anionic polyelectrolyte;

(c) combining the sample with a cationic polyelectrolyte;

(d) centrifuging the sample to obtain a supernatant and a pellet, wherein the pellet comprises the virus, if any; and

(e) assaying the pellet for the presence of the virus.

26. The assay method of claim 25, further comprising:

(f) resuspending the pellet in a buffer solution.

27. The assay method of claim 25, further comprising:

(f) separating the virus from the polyelectrolytes.

28. The method of claim 25, wherein steps (a) and (b) are carried out in reverse order.

29. The method of claim 25, wherein steps (a) and (b) are carried out simultaneously.

30. A kit for use in concentrating or purifying viruses, the kit comprising:

a tube of a suitable size and shape for use in a centrifuge;

an anionic polyelectrolyte; and

a cationic polyelectrolyte.

31. The kit of claim 30, further comprising instructions for use.

32. The kit of claim 30, wherein both polyelectrolytes are supplied in a single tube.

33. The kit of claim 30, wherein the anionic polyelectrolyte and the cationic polyelectrolyte are supplied in two separate tubes.